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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,968	06/19/2005	Michel Marcel Jose Decre	NL0210360	8314

24737 7590 07/09/2008
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER

EVANS, ERIN LINDSAY

ART UNIT	PAPER NUMBER
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4172

NOTIFICATION DATE	DELIVERY MODE
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07/09/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Office Action Summary	Application No. 10/539,968	Applicant(s) DECRE ET AL.	
	Examiner ERIN EVANS	Art Unit 4172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/19/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election Acknowledged

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-7, drawn to a system for manipulation of small objects.

Group II, claim(s) 8-9, drawn to a system for manipulation of small objects.

Group III, claim(s) 10-11, drawn to a method for manipulation of small of small objects.

2. The inventions listed as Groups I and II, I and III, and II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the systems and method do not require the same features and therefore the only common technical feature is a system, or method, for the manipulation of small objects. This cannot be a special technical feature because Morf, in publication WO 02/063678, discloses a system, and therefore a method, for the transfer/manipulation of integrated circuit chips, these chips being small objects.

3. During a telephone conversation with Tod Holmbo on May 30th, 2008 a provisional election was made without traverse to prosecute the invention of Group I, claim1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-11 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Status of Application

- 5. Claims 1-11 are pending in the application.
- 6. Claims 8-11 are withdrawn from consideration.
- 7. Claims 1-7 are presented for examination, the following rejections being made.

Priority

- 8. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

- 9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: substrate 5. The substrate is labeled as S in the drawings but is referred to as 5 in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

10. The abstract of the disclosure is objected to because the international publication title page has been submitted as the abstract. The abstract should be resubmitted on a separate sheet containing no other language. Correction is required. See MPEP § 608.01(b).

11. The abstract of the disclosure is objected to because the second sentence is a fragment sentence. When the new abstract is submitted, as required above, the second sentence should be amended to be grammatically correct. Correction is required. See MPEP § 608.01(b).

12. The disclosure is objected to because of the following informalities: grammatical errors have been found, such as line 15 of page 1 which states "Such n system". Applicant should carefully check the specification for these errors and submit corrections.

13. Claim 3 is objected to because of the following informalities: "disposed in the substrate" should be "disposed on the substrate". . Appropriate correction is required.

Claim Rejections - 35 USC § 112

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claims 1, 4, and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

16. Claim 1 recites the limitation "to the carrier and/or to the substrate". It is not clear whether the scope of the claim requires the fluid droplet to couple the small object to the carrier, to the substrate, or to both, rendering the claim indefinite. Appropriate action is required.

17. Claim 4 recites the limitation "the target fluid droplet" in claim 1. There is insufficient antecedent basis for this limitation in the claim. Claim 3 refers to a target fluid droplet. If applicant intended for claim 4 to depend from claim 3, this correction should be made.

18. Claim 7 recites the limitation "the electrodes" in claim 1. There is insufficient antecedent basis for this limitation in the claim. Claim 6 refers to electrodes. If applicant intended for claim 7 to depend from claim 6, this correction should be made.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Morf, WO02/063678.

Claim 1 is drawn to a system for manipulation of a small object comprising a carrier, a substrate, and a fluid droplet which couples the small object detachably to the carrier or the substrate, or both. Claims 2-4 depend from claim 1 and require the limitations of a carrying fluid droplet disposed on the carrier and a target fluid droplet disposed on the substrate in a predetermined position or pattern.

Regarding claim 1, Morf teaches a system for manipulation of a small object (chip transfer method and apparatus, see abstract, the chip having a top surface of only 50 by 50 microns, Page 6 line 6, and a thickness of 7 microns, Page 8 line 13) comprising a carrier to transport the small object (element transfer holder, 4, see Figure 1 and Abstract), a substrate to receive the small object (target substrate, 2, see Figure 2 and Abstract), and a fluid droplet which couples the small object detachably to the carrier and/or to the substrate (adhesive layer, 8, and liquid droplet, 9, see Figures 1 and 2 and Abstract).

Regarding claim 2, Morf teaches a carrying fluid droplet disposed on the carrier (adhesive layer, 8, Figure 1 and Abstract).

Regarding claim 3, Morf teaches a target fluid droplet disposed on the substrate (fluid droplet, 9, Figure 2 and Abstract).

Regarding claim 4, Morf teaches that the target fluid droplet, 9, is placed on the substrate, 2, in predetermined positions or in a predetermined pattern, 12 (see Figures 2 and 3 and Abstract).

Morf teaches every limitation of the claimed invention. Claims 1-4 are therefore rejected under 35 U.S.C. 102(b) as being anticipated by Morf.

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

23. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

24. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morf, as applied to claims 1-4 above, in view of Tsuruta et al, US Patent 4,507,383.

Claim 5 is drawn to the system for the manipulation of a small object as claimed in claim 1 and discussed above, wherein the ratio of the size of the fluid droplets to the size of the object is in the range of 1/10 to 1/3.

As discussed above, Morf teaches the system substantially as claimed but fails to indicate the optimum ratio between the sizes of the droplet and object. However, Morf does teach that the patterning of predetermined hydrophilic locations for the target liquid droplets advantageously effects an automatic limitation of the liquid amount contained in the droplet (Page 4 line 23 – Page 5 line 1). He therefore indicates that this is recognized as an important parameter to limit.

Tsuruta et al teach that the ratio of adhesive thickness to adhered particle diameter is optimally between 0.2 and 0.4, overlapping with the instantly claimed range

(see Abstract). It is taught that this ratio provides particles that are adhered without having excess adhesive seep up and around the particles (Column 3 lines 9-19).

It would have been obvious to those of ordinary skill in the art at the time of the invention that the ratio taught by Tsuruta et al could be applied to the system of Morf because both are dealing with adhering objects on the scale of a micron to a thin layer of liquid. One would have sought out appropriate limits of the amount of liquid to apply as suggested by Morf. One would have been motivated to combine these references and arrive at the present invention in order to determine if the benefit of decreased excess liquid, as taught by Tsuruta et al, could allow the reversible binding and accelerated liquid evaporation, as required by Morf.

Claim 5 is therefore unpatentable over Morf in view of Tsuruta et al and is rejected under 35 U.S.C. 103(a).

25. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morf, as applied to claims 1-4 above, in view of Becker et al, US Patent 6,294,063.

Claims 6 and 7 are drawn to the system for the manipulation of a small object, as claimed in claim 1 and discussed above, wherein the substrate is provided with one or several electrodes having a shape corresponding to a shape of the small objects.

As discussed, Morf teaches the system substantially as claimed but fails to teach the use of electrodes.

Becker et al teach the use of electrodes under a surface (i.e. substrate) to manipulate packets, such as packets of fluid (i.e. fluid droplets) (see Abstract and

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column 14 lines 14-17). The electrodes may be any suitable shape (Column 14 lines 26-28). The system works by exerting forces on the packets using the electrodes, the forces being able to trap and otherwise manipulate the packets (Column 4 lines 42-46).

It would have been obvious to those of ordinary skill in the art at the time of the invention that the system of Becker et al could be used in the system of Morf because Morf requires the manipulation and trapping of small droplets of fluid on a target substrate as taught by Becker et al. Further, it would have been obvious to such artisans that the suitable shape suggested by Becker et al would be a shape corresponding to that of the small object ultimately to be adhered to the fluid droplet, in order to provide the strongest binding of the fluid and the object at the electrode. One would have been motivated to combine these references and arrive at the present invention in order to provide an increased force of coupling of the fluid, and thus the small object, to the substrate, and even the possibility of transporting the object using the electromechanical force provided by the electrodes.

Claims 6 and 7 are therefore unpatentable over Morf in view of Becker et al and are rejected under 35 U.S.C. 103(a).

Conclusion

- 26. Claims 1-11 are pending in the application.
- 27. Claims 8-11 are withdrawn from consideration.
- 28. Claims 1-7 are rejected.

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29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIN EVANS whose telephone number is (571)270-5354. The examiner can normally be reached on Monday through Friday from 7:30am to 5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIN EVANS/

3 July 2008

Examiner, Art Unit 4172

/Alain L. Bashore/

Primary Examiner, Art Unit 1792